

CLAIMS

- [1] A stirling engine, characterized in that a high temperature section and a member connecting the high temperature section and a low temperature section are formed of different materials and are integrally bonded to each other, the high temperature section being formed into an integral structure by means of a heat resistant/high heat conductive material having high heat resistance property and high heat conductivity.
- [2] The stirling engine according to claim 1, characterized in that the integral structure of the high temperature section is obtained by integrally molding an expansion space head portion and a high-temperature side heat exchanger main body with the same material.
- [3] The stirling engine according to claims 1 or 2, characterized in that the heat resistant/high heat conductive material is a ceramics selected from silicon carbide ceramics, silicon nitride ceramics, aluminum nitride ceramics, or alumina ceramics, or a functionally gradient material of the ceramics and metal.
- [4] The Stirling engine according to claims 1, 2, or 3, characterized in that the member connecting the high temperature section and the low temperature section is formed of a heat resistant/low heat conductive material having low thermal conductivity.
- [5] The Stirling engine according to claim 4, characterized in that the heat resistant/low heat conductive material is a ceramics selected from silicon oxide, cordierite, mica, aluminum titanate, or quartz ceramics, or a functionally gradient material of the ceramics and metal.
- [6] The stirling engine according to any of claims 1 through 5, characterized in that the stirling engine is a  $\beta$  type stirling engine in which a displacer piston and a power piston are disposed in the same cylinder.
- [7] The Stirling engine according to claims 1 or 2, characterized

in that the stirling engine is a  $\gamma$  type stirling engine in which a displacer piston and a power piston are disposed independently in different cylinders.

- [8]       The Stirling engine according to claims 1 or 2, characterized in that the stirling engine is an  $\alpha$  type Stirling engine having two independent pistons, which are, an expansion piston disposed in an expansion cylinder and a compression piston disposed in a compression cylinder.